

# ICT access, needs and proficiency of science teachers in Nigeria

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**Abstract:** This study examined science teachers' ICT access, needs and proficiency in Nigeria using Lagos State as a case study. Adopting a survey type of descriptive research design, questionnaire was administered on 110 science teachers from 25 randomly selected senior secondary schools.

The result obtained showed that science teachers have poor access to ICT in schools, have low proficiency in using ICT and want to acquire ICT skills for teaching.

**Keywords:** ICT, science, technology, communication, integration, internet, instruction, teachers.

## 1.0 Introduction

Science and technology can be considered as a two sides of a coin and both often depend on, and lead to one another. Just as technology is a product of science, its advancement is dependent on the quality and quantity of scientific knowledge available. Following the trends in global events, science and scientific knowledge depends on how much of technology integration into the teaching and learning of science in schools.

Studies on how teachers use Information communication Technology (ICT) are also included in most ICT integration programmes. Past studies looked into how teachers have used ICT in teaching specific subjects; into how they have employed Internet resources in teaching; how they have used email in communicating with students and other teachers; and whether they have developed their own homepages. In Australia, for example, teachers make use of self-paced learning materials on ICT use in CD-format.

Reports on a study that examined the level of instructional use of the Internet among science teachers involved in an in-service professional-development project (n=90) finds that classroom access, instructional experience using the Internet with students, availability of resource support, and number of teacher users at school are the best predictors for teachers' instructional use of the Internet

One of the goals of secondary education as stipulated in the national policy on education (FGN, 2004) is preparation for useful living within the society, and it has been emphasized that no education can rise above the quality of its teachers (FGN, 2004), and that no system in any given society, be it social, economic and/political can be better than the quality of its teachers.

It becomes imperative therefore that; for the country to enjoy the benefit of ICT in all ramifications of her economy, ICT must be fully integrated into the school system such their products can in turn improve the society.

A major approach to integrating ICT into the school system is to prepare the work force to be adequately ready for such integration. This preparation can only be done successfully by carrying out status and needs assessment of ICT within the system, a task being carried out by this study.

## 2.0 Research Problem

*Research has shown that teachers lack adequate support for the use of information and communication technologies (ICT). This has created serious obstacles to effective student learning with the aid of technology (U.S. Congress, Office of Technology Assessment, 1995; U.S. President's Committee of Advisors on Science and Technology & Panel on Educational Technology, 1997). The argument that the effective use of technology in the classroom is dependent upon the availability of teacher technology support has been noted in numerous studies of school-wide and classroom-based technology implementations*

It has also been emphasized that no education can rise above the quality of its teachers (FGN, 2004), and that the system in any given society, be it social, economic and/political cannot be better than the quality of its teachers. The Herculean task before this study therefore is to examine the availability and access to information and communication technologies by science teachers in Nigerian secondary schools, their needs and proficiency in using in their work activities on daily basis.

### 2.1 Research Questions

- i. How do Science Teachers access ICTs?

- ii. What are the ICTs needs of Science Teachers?
- iii. What is the proficiency level of Science Teachers in utilizing ICTs in their classrooms?
- iv. Is there a significant difference in Science Teachers' access to ICTs based on School Type?
- v. Is there a significant difference in Science Teachers' ICTs proficiency based on gender and school type?

## 2.2 Research Hypotheses

- i. There is no significant difference in Science Teachers' access to Proficiency based on gender and school type

## 3.0 Methodology

Survey type of descriptive research design was adopted in the study. It involved the administration of questionnaire on a total of 110 science teachers from 25 randomly selected private and public senior secondary schools in Ojo Local Government area of Lagos State. Nine public and sixteen private senior secondary schools within the local government were selected by simple random sampling, specifically by balloting.

A self developed questionnaire was used in the study. The questionnaire was divided into four sections; background information; ICT skills needs and access; proficiency level and factors influencing science teachers' use of ICT.

A pilot study carried out to determine the reliability of the instrument gave reliability co-efficient of 0.78.

The instrument was administered personally by the researchers. Data collected were analyzed using SPSS for windows, Descriptive statistics such as frequency counts, percentage, mean, standard deviation and bar graphs were used in the analysis to answer the various research questions of the study. T-test for independent samples and analysis of variance were also used to test hypotheses raised in the study.

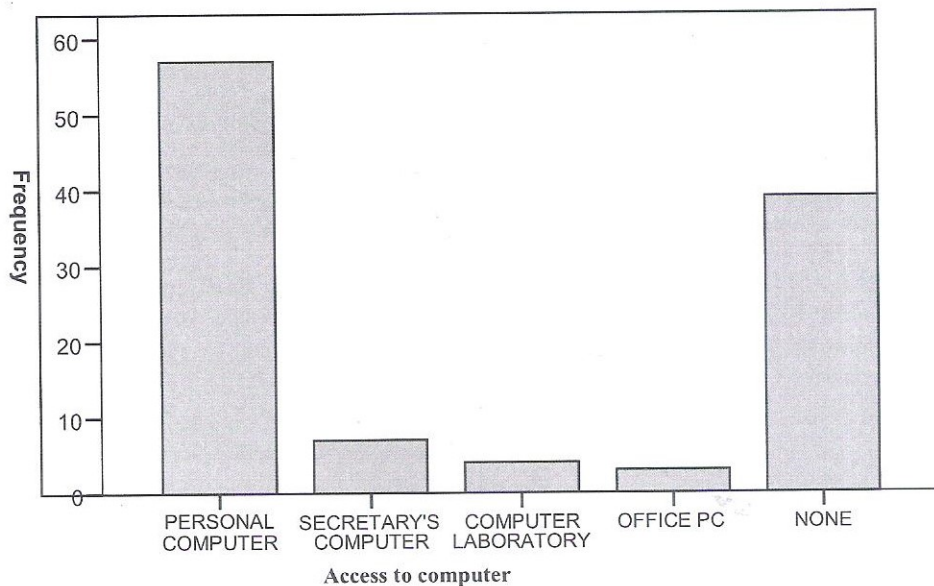
## 4.0 Results

Analysis of questionnaire items on access to computer (Table I and fig I) showed that 51.8% of the sampled teachers have access to personal computer to prepare their lesson. However, 35.5% do not have access to the computer at all. This result is presented in table I below:

Table I Access to Computer

	Frequency	Percent
PERSONAL COMPUTER	57	51.8
SECRETARY'S COMPUTER	7	6.4
COMPUTER LABORATORY	4	3.6
OFFICE PC	3	2.7
NONE	39	35.5
Total	110	100.0

## ACCESS TO COMPUTER



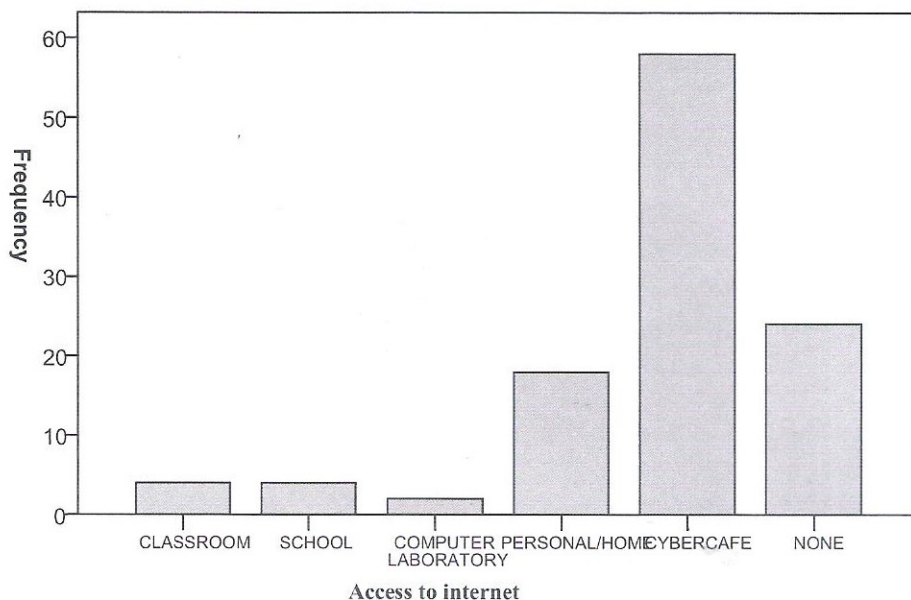
As shown in table II below, majority of the science teachers (52.7%) access the internet at the cyber café while 21.8% do not use the internet at all. 16.4% however have personal access to internet at home while 3.6% claimed to have access to internet in the school. Only 1.8% has access to the internet in the school laboratory (see fig II below)

Comparing the science teachers' access  
**Table II** **Access to Internet**

	Frequency	Percent
CLASSROOM	4	3.6
SCHOOL	4	3.6
COMPUTER LABORATORY	2	1.8
PERSONAL/HOME	18	16.4
CYBERCAFE	58	52.7
NONE	24	21.8
<b>Total</b>	<b>110</b>	<b>100.0</b>

Comparing the sample science teachers' access to computer, the interest and their skills in the use of internet based on gender, the results obtained showed that male science teachers have higher mean score than their female counterparts in access to computer, access to internet and skills in surfing the internet.

## ACCESS TO INTERNET



**Table III**

**Access to Internet by Gender**

SEX		ACCESS TO COMPUTER	ACCESS TO INTERNET	USE OF INTERNET	SURFING THE INTERNET
FEMALE	Mean	1.71	4.50	2.17	2.23
	N	56	56	56	56
	Std. Deviation	1.4	1.13	0.76	0.79
MALE	Mean	3.59	5.04	3.1481	3.15
	N	54	54	54	54
	Std. Deviation	1.80	1.12	0.94	0.92
Total	Mean	2.6	4.77	2.64	2.68
	N	110	110	110	110
	Std. Deviation	1.86	1.15	0.98229	0.96671

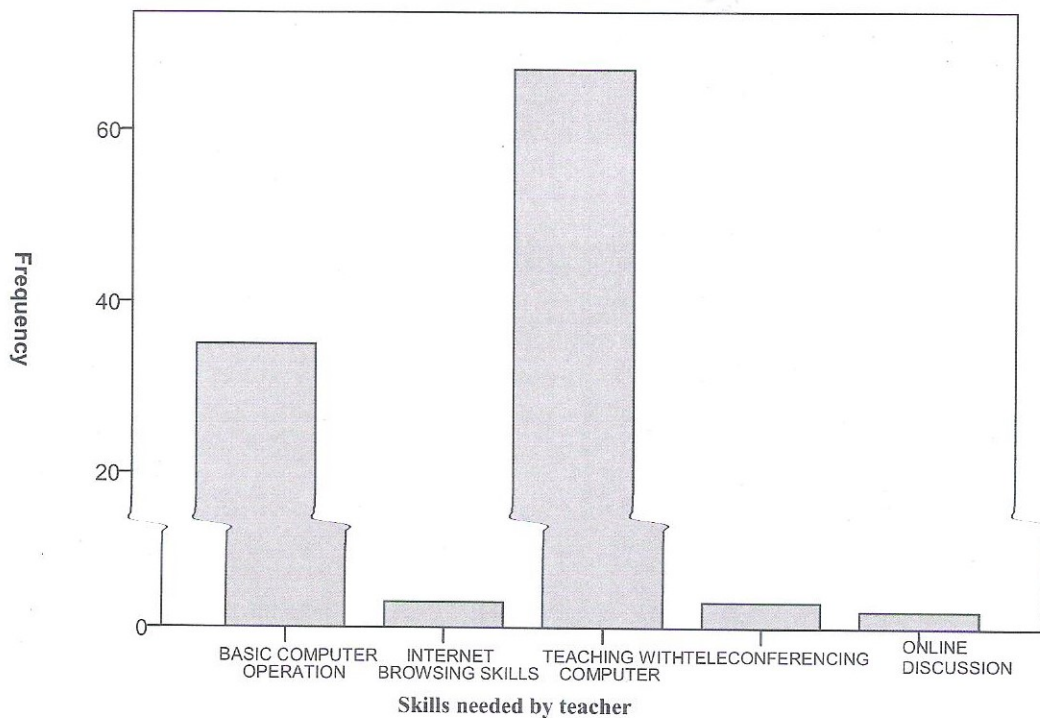
### 4.1 Skills Needed By Teachers

From the analysis of responses on skills needed by science teachers (Table IV), 60.9% wish to learn how to teach with the computer. This is followed by 31.8% who want to acquire basic computer operation skill. 2.7% of the teachers want to acquire internet browsing skills and teleconferencing, while 1.8% wants to acquire on-line discussion skills.

**Table IV Skills Needed By Teachers**

SKILLS NEEDED BY TEACHERS	Frequency	Percent
Basic computer operation	35	31.8
Internet browsing skills	3	2.7
Teaching with computer	67	60.9
Teleconferencing	3	2.7
Online discussion	2	1.8
Total	110	100.0

**Skills needed by teacher**



The first null hypothesis was tested by comparing the mean score in ICT proficiency of the sampled science teachers based on gender using t-test. The result obtained is presented in table V below:

**Table V: t-test Analysis of Teachers' ICT Proficiency based on Gender**

SEX	N	Mean	df	Std. Deviation	t-cal	t-critical
Female	56	15.3571	108	4.80314	4.218	1.98
Male	54	11.4815		4.83205		

As shown in table V above, the calculated-t value is greater than t-critical at  $N_1+N_2-2$  degree of freedom and 0.05 level of significance ( $4.22 > 1.98$ ). This implies a significant difference between male and female proficiency level in the use of ICT.

**Table VI: t-test Analysis of Teachers' ICT Proficiency based on School Type**

SCHOOL TYPE	N	Mean	df	Std. Deviation	t-cal	t-critical
Public school	52	12.6731	108	5.18944	1.508	1.98
Private school	58	14.1552		5.10521		

Comparing the teachers' proficiency level based on school type, the calculated -t value is less than t-critical ( $1.51 < 1.98$ ) at  $N_1+N_2-2$  degree of freedom and 0.05 level of significance. This implies a non significant difference in science teachers' ICT proficiency based on school type.

## 5.0 Discussion

The results of this study showed that majority of science teachers do not have access to computer and the internet in their school except through personal ownership or commercial cyber café. This finding is in agreement with Nwaboku (2006) who posited that "information and communication technology facilities have been largely invaluable in Nigeria school system at all levels and that you cannot use what you don't have". A study by Akuduolu and Anekwe (2004) found dismal lack of computer facilities in primary school, teachers do not use ICT facilities for curriculum; teachers do not engage in ICT team teaching and do not organize ICT activities in primary school.

According to Igbuzor (2006), there is the problem of poor infrastructures and lack of teaching and learning materials. A huge number of primary, secondary and tertiary school buildings and facilities are dilapidated and unfriendly to pupils. The environment of teaching and learning is not conducive.

It has also been revealed that the science teachers have low proficiency in ICT utilization. The issue of proficiency and skilled in ICT is directly related to availability and access of teachers to these technologies (Nwaboku 2006)

This study also found that science teachers are willing to acquire various skills of ICT especially to support their teaching. This also reiterates the above relationship between accesses to ICT in their utilization. Non use of ICT and have low skills may be caused by resources not been accessible and not by teachers' refusal or reluctance to use them.

There are a lot of challenges facing Nigeria and making it difficult for good quality education that is empowering and capable of bringing about sustainable development to be provided. Such challenges include inadequate funding by federal, states and local governments, to the extent that funding has been in response to conditionality imposed by international financial institutions (IFIs). Statistics show that federal government expenditure on education between 1997 and 2000 has been below 10% of overall expenditure (Igbuzor, 2006). The national expenditure on education cannot be computed because various states expenditure on education cannot be determined, in relation to the UNESCO recommendation of 26% of national budgets.

## 6.0 Conclusions

Based on the findings of the study, the following conclusions are drawn

- Science teachers do not have adequate access to ICT within the school.
- Science teachers want to acquire basic computer and utilization in ICT in training.
- Science teachers have low proficiency in ICT utilization and this is independent of this gender school type and is of specialization.

## 7.0 Recommendations

The following recommendations are hereby put forward

- All science teachers should be expressed to a mandatory training programme in ICT to enable them integrate ICT into their instructional activities.
- Government should equip schools with ICT facilities and enabling infrastructure
- Parents Teachers' Association (PTA) and NGO's should provide necessary support to government effort in making schools ICT compliant.
- Teachers training institutions and programmes should endeavour and be assisted to provide science teachers who are ICT compliance.

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